

WHAT IS CLAIMED IS:

1. A CPP giant magnetoresistive head comprising:
lower and upper shield layers with a predetermined
5 shield distance therebetween; and
a giant magnetoresistive element disposed between the
upper and lower shield layers and comprising a pinned
magnetic layer, a free magnetic layer, and a nonmagnetic
layer disposed between the pinned magnetic layer and the free
10 magnetic layer, a current flowing perpendicularly to the film
plane of the giant magnetoresistive element;
wherein large-area nonmagnetic metal films are provided
directly above the lower shield layer and below the upper
shield layer to make direct contact with the pinned magnetic
15 layer and the free magnetic layer, respectively, of the giant
magnetoresistive element, and the large-area nonmagnetic
metal films have larger areas than those of the pinned
magnetic layer and the free magnetic layer, respectively.
- 20 2. The CPP giant magnetoresistive head according to
claim 1, wherein each of the lower and upper large-area
nonmagnetic metal films is formed to a thickness of 1/4 or
more of the shield distance, and the giant magnetoresistive
element is formed to a thickness of 3/4 or less of the shield
25 distance.
3. The CPP giant magnetoresistive head according to
claim 2, wherein the thickness of the lower and upper large-

area nonmagnetic metal films is 60 Å to 300 Å.

4. The CPP giant magnetoresistive head according to
claim 1, wherein a nonmagnetic metallic material used for
5 forming the large-area nonmagnetic metal films contains at
last one element of Au, Ag, Cu, Ru, Rh, Ir, Pd, Ni-Cr, (Ni-
Fe)-Cr, and Cr, and when the nonmagnetic metallic material
contains Cr, the Cr content exceeds 20 atomic percent.

10 5. The CPP giant magnetoresistive head according to
claim 4, wherein a nonmagnetic metallic material for forming
the large-area nonmagnetic metal film formed directly above
the lower shield layer comprises Ta/Cu, Ta/Ru/Cu, Ta/Cr,
Ta/Ni-Cr, Ta/(Ni-Fe)-Cr, or Cr, and when the nonmagnetic
15 metallic material contains Cr, the Cr content exceeds 20
atomic percent.

6. The CPP giant magnetoresistive head according to
claim 1, wherein the pinned magnetic layer extends to the
20 rear of the free magnetic layer and the nonmagnetic layer in
the height direction, and the dimension of the pinned
magnetic layer in the height direction is larger than that in
the track width dimension.

25 7. The CPP giant magnetoresistive head according to
claim 1, further comprising an antiferromagnetic layer
provided in the rear of the pinned magnetic layer in the
height direction, for pinning the magnetization direction of

the pinned magnetic layer.

8. The CPP giant magnetoresistive head according to
claim 1, wherein the pinned magnetic layer extends in the
5 track width direction beyond the free magnetic layer and the
nonmagnetic layer, and the giant magnetoresistive element
further comprises antiferromagnetic layers provided on both
sides of the pinned magnetic layer in the track width
direction, for pinning the magnetization direction of the
10 pinned magnetic layer.

9. The CPP giant magnetoresistive head according to
claim 1, wherein the pinned magnetic layer has a laminated
ferrimagnetic structure comprising a first pinned magnetic
15 layer, a nonmagnetic intermediate layer, and a second pinned
magnetic layer, the first pinned magnetic layer extends in
the track width direction, and the giant magnetoresistive
element further comprises antiferromagnetic layers provided
on both sides of the first pinned magnetic layer in the track
20 width direction, for pinning the magnetization direction of
the first pinned magnetic layer.

10. The CPP giant magnetoresistive head according to
claim 1, wherein the giant magnetoresistive element does not
25 include the antiferromagnetic layer, the pinned magnetic
layer comprises a magnetic material having a positive
magnetostriiction constant or a magnetic material having high
coercive force, and the pinned magnetic layer is exposed at

the surface facing the recording medium.

11. The CPP giant magnetoresistive head according to
claim 9, wherein part or entirety of the second pinned
5 magnetic layer comprises Fe-Co-Cu (wherein Fe > 10 atomic
percent, Co > 30 atomic percent, and Cu > 5 atomic percent),
Fe-Co-Cu-X (wherein X is at least one element of Pt, Pd, Mn,
Si, Au, and Ag), or Co₂MnY (wherein Y is at least one element
of Ge, Si, Sn, and Al).

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12. The CPP giant magnetoresistive head according to
claim 1, wherein part or entirety of the free magnetic layer
comprises Fe-Co-Cu (wherein Fe > 10 atomic percent, Co > 30
atomic percent, and Cu > 5 atomic percent), Fe-Co-Cu-X
15 (wherein X is at least one element of Pt, Pd, Mn, Si, Au, and
Ag), or Co₂MnY (wherein Y is at least one element of Ge, Si,
Sn, and Al).

13. The CPP giant magnetoresistive head according to
20 claim 1, further comprising hard bias layers provided on both
sides of the giant magnetoresistive element and between the
large-area nonmagnetic metal films, and an insulating layer
filling in each of the spaces between the hard bias layers
and the large-area nonmagnetic metal films.